early stages of carcinoma, and the unnecessary sacrifice of her breast. Any woman will unhesitatingly suffer mutilation in order to save her life, but the unnecessary sacrifice of a breast is to her a tragedy of only slightly less degree than loss of her life. The up-to-date surgeon today can assure his patients that they need have no fears regarding mistakes either of omission or commission. He employs the exploratory incision and through a knowledge of the gross and microscopic pictures can proceed with the treatment with absolute certainty.

Bloodgood is accredited with the adage that simple amputation of the breast is not enough for carcinoma and is too much for anything else. There are exceptions to the rule regarding the simple amputation of the breast, and Doctor Kilgore has named and described them. The cyst adenoma which he discusses may either be benign or malignant. Ofttimes the benign form is diagnosed cancer, and this error has resulted in some reported cures of cancer without the complete operation. At any rate, cystadenoma is precancerous if not already malignant, and calls for amputation of the whole breast or the complete operation. It should be emphasized, however, that the exceptions to the rule constitute only a very small percentage and that complete removal of the breast is seldom justified.

Doctor Kilgore's paper is timely and instructive. A surgeon is no longer justified in operating on any breast without a knowledge that will enable him to interpret what he sees at exploratory operation or without a pathologist with that information to advise him. Furthermore the time has come when hospital pathologists must be thoroughly trained in breast-gland histology because the number of breasts to be explored is already considerable and is increasing rapidly. Careful study of this and other articles is highly recommended and, above all, thorough study of all breast specimens both at the operating table and later in the laboratory.

THE FULL-TIME PROFESSORSHIP IN MEDICAL EDUCATION

By PHILLIP E. ROTHMAN, M. D.
Los Angeles

FOR over a decade physicians and educators have been concerned with a phase of medical education known as the full-time or whole-time system. The subject is of unusual importance and has provoked one of the most stirring and bitter controversies recorded in medical history. Upon its solution depends, to a large extent, the future of American medical education.

Only to emphasize how critical this question has become, it is interesting to note that Harvey Cushing in his recent biography of Osler still fears to make public Doctor Osler's letter to Remsen on the full-time system because as he says, "It is too intimate to publish in full until the still troubled waters he speaks of shall have temporarily quieted down to await the next beneficial agitation." Any analysis of the system is extremely difficult, for it is dependent on a wide variety of factors, and the results at various institutions are by no means uniform. Nevertheless there are certain remarks which are applicable to the entire system, and changes to be made which should prove generally beneficial.

AMERICAN ORIGIN OF THE FULL PROFESSORSHIP SYSTEM

To define the full-time system may best be done by quoting the original announcement of the General Education Board of the Rockefeller Foundation when, in 1913, the sum of one and a half million dollars was given to the Johns Hopkins Medical School "for the purpose of so organizing the departments of medicine, surgery and pediatrics that the professors and their staffs might completely withdraw from private practice in order to devote their entire time to their respective departments." Needless to say this announcement created tremendous agitation and medical men at once became divided in their opinions on the matter. The benefits of the plan are, of course, apparent to everyone. How much more advantageous it would be if men of ability, unhindered by the trials and financial worries of private practice, could devote all their time to the hospital, the students and to research. The arguments against the plan may best be stated by quoting extensively from Osler's letters (Cushing). It must be remembered that Osler, as Regius Professor of Medicine at Oxford, was not only the leading physician of the day, but a classical student of considerable reputation and an educator as well.

OSLER'S VIEWPOINTS

The first letter was written to Doctor Remsen and intended for the Hopkins faculty only:

" . . . The subject of whole-time clinical teachers, on which I send you the promised note, is one of great importance, not only to universities, but to the profession and to the public at large. It is a big question, with two sides. I have tried to see both, as I have lived both, and as much perhaps as anyone, can appreciate both. . . . These are some of the reasons why I am opposed to the plan as likely to spell ruin to the type of school I have always felt the hospital should be and which we tried to make it—a place of refuge for the sick poor of the city; a place where the best that is known is taught to a group of the best students; a place where new thought is materialized in research; a school where men are encouraged to base the art upon the science of medicine; a fountain to which teachers in every subject would come for inspiration; a place with a hearty welcome to every practitioner who seeks help; a consulting center for the whole country in cases of obscurity. And it may be said, all these are possible with whole-time clinical professors. I doubt it. The ideals would change, and I fear lest the broad open spirit which has characterized the school should narrow, as teacher and student chased each other down the fascinating road of research, forgetful of those wider interests to which a great hospital must minister."

In an address at St. Bartholomew's Hospital the subject is again discussed:

" . . . It is attractive to think of a group of superclinicians, not bothered with the cares of consulting practice, and whose whole interests are in scientific work. It is claimed that as much good will follow the adoption of the plan of whole-time clinicians as has followed the whole-time physiologists and anatomists. Against it may be urged the danger of handing over students who are to be general practitioners to a group of teachers completely out of touch with the conditions under which these young men will have to live. The

clinician should always be in the fighting line, and in close touch with the rank and file, with the men behind the guns who are doing the real work of the profession. The question, too, is whether the best men could be secured; whether academic and scientific distinctions would satisfy these men. Then for the hospital itself, would it be best to keep our best in clinical seclusion. Would there not be the danger of the evolution throughout the country of a set of clinical prigs, the boundary of whose horizons would be the laboratory, and whose only human interest would be research? I say frankly that I am not in favour of the whole-time clinical teacher."

And finally in a letter to Dr. George Dock, he adds that:

" . . . It would be (he said) a very good thing to have a few men at research institutes—Cole at the Rockefeller, for example—devoting all their time to the work, but what I dread is to have a class of clinicians growing up out of touch and necessarily out of sympathy with the profession and with the public. This would be nothing short of a calamity. There are always men of the quiet type like Halsted who practically live the secluded life. To have a whole faculty made up of Halsteds would be a very good thing for science, but a very bad thing for the profession."

ABRAHAM FLEXNER'S INFLUENCE

The leading figure in medical education at that time was Mr. Abraham Flexner. He was an officer of the General Education Board which financed the full-time academic programs. His article on "Medical Education in the United States and Canada" was largely responsible for eliminating many of the poorer schools and raising the standards of others. In regard to this report Osler stated that "it had done much good," but that it was also "full of errors and misconceptions." Many of Mr. Flexner's critics, including Doctor Osler, attribute his frequent misinterpretations of medical affairs to the fact that he is an "outsider" or one who does not possess a medical degree. The opposition, of course, had no actual facts and no reliable data at its disposal. They could only peer into the future and guess at the results. We know now that they were prophets of no mean ability and that their fears were well founded. However, Mr. Flexner, Doctor Welch and others carried the day, and the full-time system went into effect.

THEODORE JANEWAY'S CONCLUSIONS

Dr. Theodore Janeway was appointed the first full-time professor of medicine at Hopkins and, in 1918, he published his opinions on the system. This was the first article to appear from a man of sound judgment who had had the opportunity of witnessing at first hand the workings of the system. Despite its importance, it attracted little or no attention, chiefly because it was printed in *Educational Reviews,* a small journal with a limited circulation. There are queer rumors afloat that the article was destined for a more prominent magazine, but was partially suppressed and later allowed to appear in the aforementioned publication. No attempt has been made to verify the authenticity of these rumors. In the April 21, 1928 number of the *Journal of the American Medical Association* the article was republished after an interval of ten years, and its present interest signifies that the problem still occupies a very prominent position.

Doctor Janeway analyzed the system remarkably well and emphasized particularly the necessity and value of outside consultations which were now denied him. He recorded his opinion that "such consultations with good practitioners at their patients' bedsides, beyond their value to the patient, are mentally stimulating to the consultant and have great educational value for the physician who calls him. They demand the highest qualities of mind and heart, and always the great medical teachers of the past have been great consultants. They extend the influence of the school beyond its students to the profession of the community. They likewise keep the teacher in touch with the point of view and needs of the practitioner. They can be declined whenever they conflict with university engagements and entail an absolutely limited and not a continuing obligation." He also felt that professional activities should not be subject to definite university rules. It implied that the men were not to be trusted to prefer university duties if given full freedom, and full freedom is the most prized possession of the university teacher. The rigidity of the system seemed to him a great drawback and there was always a constant danger that it would lead to a loss of initiative and a tendency toward easy acquiescence in a rather routine and sheltered life. A very pertinent objection which he greatly stressed was the question of individual responsibility. In a full-time department no one man assumes complete responsibility. "A mistake or omission on the part of any single member of the staff is minimized or offset by some other member's diligence. This is the indispensable condition for training young physicians without jeopardizing the welfare of the patients. In equal measure it becomes an obstacle in the training of the more mature. A sense of deep individual responsibility, so essential in making and keeping a good physician and which is assured by the acceptance of money for his services, is, therefore, lacking for the upper members of a hospital staff." Eventually it seems that such a system will produce a type of teacher who is inferior to the teacher consultant of the past. He especially decried the "holier than thou" attitude of the full-time men toward the rank and file of the profession. The complaint that the head of the department is exposed to an increasing burden of petty administrative detail is clearly evident in many departments today. It is an evil, however, which may exist under any system and deserves no further mention here. Finally he believed that the system could be remedied by permitting outside practice and by giving term and not life appointments. Abuse of their positions should result in dismissal which, in virtue of their outside practice could be accomplished without hardship to the

individual or the university. The salaries should be proportionate to the time given to teaching and research so that each individual should not be obligated to give to the department any work except along such lines as those to which he is best fitted.

GEORGE DOCK'S OPINION

In 1921 Dr. George Dock, the first full-time professor of medicine at Washington Medical School, spoke on the full-time system before the Southern Medical Association. His paper (*Southern Medical Journal,* 1922, XV), although very different from Doctor Janeway's, contains many practical points which cannot be disregarded. He showed very clearly that the system had failed to provide or make good the fundamental conditions stated at its inauguration. It had not provided adequate salaries to permit the staff to lead lives exempt from the cares and temptations of practice. Actually, it would seem that the cares and temptations had become augmented. Secondly, it had not provided "adequate university hospitals fully controlled by the medical school with proper clinical material, fully equipped laboratories, library and staffs, not only for teaching and research, but also for the care of the patients." He reasoned that no difficulty would be encountered in finding able men for all positions if these initial requirements were fulfilled. Although at present some few institutions have excellently equipped hospitals he felt that it was perfectly idle for schools that cannot raise the necessary money to think about full time. The full-time system had not taken cognizance of the changing value of money and that in 1921 money was worth just half as much as when the system started. "Too much attention, he said, has been given to the salary of the head of the department." The salaries of the younger men on the staff are so meager that the system has a tendency to force younger men out of academic life just as they begin to be valuable to the institution. He is either driven to private practice or another school with usually more advance in administrative duties than of salary. The school he leaves must take a younger or less mature man. This seems in direct conflict with the full-time theory. We need to develop not only the head, but a good staff. He estimates that between seventy thousand and one hundred thousand dollars is necessary for the annual budget of one department (medicine). In order to secure this amount an ominous change has occurred. Instead of the necessary funds coming from the university treasuries, as originally planned, the staffs are now expected by some university administrators to earn the income needed not only for their own salaries, but by their departments or even other departments by securing rich patients and charging them large fees or even by collecting small fees from a large service. The vicious features of such schemes are evident, and Doctor Dock has pointed out very clearly many of the dangers and evils that would eventually arise. He concludes by again emphasizing the point that the success of the system depends largely on the ability to raise properly sufficient funds to carry out the original plans.

CONDITIONS DURING A TEN YEARS' TRIAL

Nearly ten years have elapsed since the publication of Doctor Janeway's article and a final judgment in regard to the success of the system is still an impossibility. It must be emphasized that very drastic changes may take place in medical education and hospital work without any demonstrable effect on the public at large. It is not at all comparable to a business institution where one system means success and the other failure. Only those who are intimately concerned with the changes and actively engaged in the work are aware of the differences. Very few of the men who accepted full-time positions at the inauguration of the system are alive today. The positions are occupied at the present time by the so-called second generation of full-time men. It seems, as one gathers all the facts together, that the first régime was a complete success. The men fulfilled every expectation and built up enviable reputations for their departments. The research work of the period attracted universal attention and the students received the very best in medical education. The possibility that these men succeeded because of their remarkable ability and not as a result of the system is a very real one. One feels that they would have done just as well under any system or any condition. The basis for this supposition is due to the lack of success of the present régime and the vast difference that is at once apparent between the departments of today and the former ones. The fears of Osler and Janeway have become realized. The young men who have grown up in the somewhat "cloistered seclusion" have not become "masters of their art." It must be emphasized that there are exceptions, but that these few unusual men are rarities and have become great medical leaders despite the system, so to speak. Many of the early full-time men had been engaged in private practice or part-time work before assuming their positions. This one fact, I believe, is largely responsible for the success they achieved. At present, as Osler stated, we are handing over our students who are to become general practitioners to a group of teachers completely out of touch with the conditions under which these young men will have to live.

Of particular interest is an investigation of those specific factors in the system which have prevented the average young full-time men from becoming able and leading clinicians. The absence of experience in private practice has already been emphasized. One must remember that the majority of patients in private practice have no organic ailment. Their suffering, however, is fully as real and significant as the more dramatic emergencies seen in the hospital. There is little doubt that the good practitioner can benefit his average patient and accomplish far greater results than a member of a full-time medical staff. Doctor Peabody in an article published in the *Journal of the American Medical Association* (1928, Vol. 90, April 14), states that "experience has made it perfectly clear that the men who are in successful outside prac-

tice have something very definite and important to contribute to the teaching, and, as already indicated, they must be regarded as an integral part of the teaching service and receive proper recognition in the way of titles, salaries and clinical opportunities."

There also exists in many full-time departments of today an insistent demand for the publication of research work. This obligation is keenly felt by each member of the department, and is the one factor above all others which threatens to destroy the present system. Many of the medical articles are no longer accurate scientific contributions, but have degenerated in a large measure to nothing more or less than a form of advertising. Fielding Garrison (*American Mercury,* Vol. VII, 1926), quotes Ochsner as having shown that many "bulky *arbeiten* are sterile, stodgy, prolix compilations, the substance of which could be reduced to a few pages. He also mentions the late President Woodward of the Carnegie Institution, who saw modern medical literature as a gigantic unnecessary proliferation, its bibliographies, tending to become "repositories of trash." He mentioned men like Halsted, "who wrote little and then well and to the point," as all too few today.

MAJOR DIVISIONS OF MEDICAL RESEARCH

Medical research has two principal divisions: the one form, popularized by Boerhaave and Sydenham, consists in recording accurate clinical observations gleaned from hourly bedside attendance; the other type is based on pure science and is carried out chiefly in the laboratory. Both are essential and equally important, but in recent years the latter has come to occupy perhaps a superior position which is not entirely justifiable. The result has been that the young men have entered into this type of research unmindful of the fact that ordinary college and medical school training in no way equip them for scientific investigation. Complicated problems are attacked and an enormous amount of time and money are consumed. Technical difficulties and repeated mistakes make the undertaking a very laborious one. Not infrequently incomplete or erroneous results are rushed off to print and only serve as one of the many useless articles which clutter up the medical literature today.

It is important to realize that a well-trained chemist could solve many of these problems in a much shorter time at very little expense. It is still more important that a year or two have elapsed in which clinical work has been largely neglected for research. Peabody states that "experience has made it clear that one of our common errors is to expect too much of these men in that we allow them to work too independently both for the good of their own training and for their productiveness. With rare exceptions, few men are qualified either technically or intellectually to carry on clinical research of any great importance until they have had several years of experience in laboratory work and in the study of disease in the wards. This means that it is only the older members of the medical staff who may be expected to undertake continuous problems of any particular significance."

THE SYSTEM, AT PRESENT AND IN THE FUTURE

The question emphasized by Osler as to whether the best men could be secured for full-time positions is of primary importance. It is a well-known fact that during the last few years the greatest difficulty was encountered in filling several supposedly desirable positions. These positions remained vacant for intervals of one to three years. Men in private practice or part-time work will rarely accept full-time appointments. Three new medical schools have been organized recently and vacancies or temporary appointments are frequent occurrences. So few well-prepared men are available that institutions are willing to wait a considerable length of time if there is any possibility of securing their services. It is interesting to contrast existing conditions to a scene that took place in Göttingen some seventy-five years ago when a Prussian Geheimrath offered Jacob Henle the chair of anatomy at Berlin and requested a decision within forty-eight hours. It is also noteworthy that in recent years several prominent teachers have given up full-time work for private practice.

Janeway pointed out that full-time men must be masters of their subjects. Only long practical training can make them masters and constant application can keep them such. These qualities are acquired at the bedside and operating table. Still, promotion and calls to other universities depend largely on research achievements. A full-time professor recently told me that he had no room in his department for the pure clinician. This unfortunate tendency is emphasized by Peabody, who says that "too little attention is paid to broad clinical experience, something that is acquired only by many years of hard work and too much attention to research ability, or, what is worse, to the possible development of research ability in some promising young men. The publication of a number of good papers does not really indicate any marked capacity for investigation, and such papers certainly offer limited evidence of ability to run a department of medicine." Janeway felt that it was impossible to become a master clinician when both research and teaching were required. John Howland was one of the very few men who accomplished all three, but he was in all likelihood what we have come to term a genius. Most men find it difficult to become proficient in one, and since present departments demand all three, only glaring mediocrity results.

A somewhat different condition exists in the departments of surgery, gynecology, urology, and obstetrics as compared to medicine, pediatrics and psychiatry. The former to a certain extent escape the detrimental effects of the full-time system. No amount of research work will secure a full-time clinical position if the applicant's technical operative ability is not first-rate. Moreover the the surgical branches realize much more keenly the necessity of daily application and rarely neglect the clinical side. The medical group, however,

is entirely different. Men who have been doing laboratory work for years are given clinical positions with a ward of patients to treat and students to teach. The position has been awarded as the result of research achievement. Research is now neglected and student and patient fare badly while clinical experience is slowly and laboriously acquired. The surgical services are largely free of these "converted investigators." Serious blunders are usually avoided, as the responsibility is so divided that someone saves the situation. Repeated mistakes, especially in the interpretation of physical signs and laboratory tests, are not infrequent. There is an excess of indulgence in new therapeutic fads, and the necessary conservatism, which is indispensable in training students and which comes only from long clinical experience, is lacking. The deficiencies of these full-time men are quickly observed by the ever critical students, interns, and house officers. The autopsy table reveals many more clinical errors today than during the first full-time régime. Discontent and open rebellion occur from time to time, and the realization that a complete full-time system is impossible can no longer be doubted. The "let it alone" spirit of the older generation is, as always, strenuously combated by the more radical spirit of youth. Changes will be made, and the spirit expressed in one of Randolph Bourne's essays seems strikingly evident just now. "Youth does not simply repeat the errors and delusions of the past, as the older generation with a tolerant cynicism likes to think; it is ever laying the foundations for the future. What it thinks so wildly now, will be orthodox gospel thirty years hence. The ideas of the young are the living, the potential ideas; those of the old, the dying or the already dead. This is why it behooves youth to be not less radical; but even more radical than it would naturally be. It must be not simply contemporaneous, but a generation ahead of the times, so that when it comes into control of the world it will be precisely right and coincident with the conditions of the world as it finds them."

833 Pacific Mutual Building.

PYELOGRAPHY*

ERRORS IN TECHNIQUE AND INTERPRETATION

By MILEY B. WESSON, M. D.
San Francisco

DISCUSSION *by George G. Reinle, M. D., Oakland; Guy Manson, M. D., Fresno; J. C. Negley, M. D., Los Angeles.*

PYELOGRAPHY is a modern procedure. Voelcker and von Lichtenberg, in 1906, used colloidal silver suspension for outlining both the bladder and the kidneys; Albarran and Ertzbischoff, in 1908, confirmed their work and recommended the procedure to the French Urological Association; Braasch, in 1910, popularized pyelography in the United States and in 1911 Sir John Thomson-Walker introduced it into England.

In the beginning the procedure was used only by trained specialists but with the gradual elimination of the various dangers and the common use of the cystoscope by general practitioners, the making of pyelograms has been put in the same category with the appendectomy—practically everybody doing them. However, pyelography and even simple cystoscopy is still held responsible for an occasional death and hence must not be regarded as a harmless maneuver. In this paper an attempt is made to emphasize the simplicity and exactness of the various steps and at the same time call attention to the dangers that beset the path of the bold but untrained novice.

ANESTHESIA

All methods of anesthesia are in use, probably the most popular being a hypodermic of morphin and the injection of one ounce of 4 per cent novocain into the empty bladder one-half hour before the cystoscopy. Sacral and spinal anesthesia are not widely popular because of technical difficulties, and general anesthesia is rarely used, for obvious reasons, but in children, highly neurotic adults and those with irritable bladders it is often necessary. The total lack of sensation in the bladder makes the cystoscopy very easy but unfortunately the patient is unable to tell when his bladder is over-filled and pathological tissue often tears very easily. This danger was impressed upon me long ago by a famous cystoscopist who admitted four ruptures of the bladder under general anesthesia and in each case only a small amount of fluid was used.

STERILIZATION OF CYSTOSCOPE AND CATHETERS

Any method of sterilization that does not soften the litharge of the cystoscope lens so as to allow moisture to enter and fog the mirror is satisfactory. Heat must be avoided. Dipping the cystoscope in phenol, followed by washing in water and then immersing in alcohol is the most popular method. The more dilute the phenol and alcohol the longer the cystoscope can be left in the solution without damaging the instrument.

Sterilizing catheters by soaking them in mercuric cyanid solution and siphoning the solution through them is a stereotype procedure. Formaldehyd or formalin vapor is equally popular, but unless this antiseptic is thoroughly washed out all infected urine specimens will have been sterilized and the cultures will consequently be negative—and misleading. Boiling catheters, or keeping them in glass tubes connected with a receptacle of liquid formaldehyd causes them to become soft.

IRRIGATING FLUID

The irrigating medium in large clinics and hospitals is boiled water, but no private office can provide this in sufficient quantity, hence tap water is commonly used and to this is added the proper amount of some colorless antiseptic such as meroxyl or mercuric cyanid. The bladder is not sensitive to temperature, hence cold water can be used. Oversympathetic nurses are inclined to use warm water and this tends to fog the cystoscope lens and often softens the catheters to such

* Read before the San Francisco County Medical Society, November 29, 1927.